

104.10 Light Stable Isotopic Materials (gas, liquid and solid forms)

These RMs are for calibration of isotope-ratio mass spectrometers and associated sample preparation systems. They are distributed by NIST on behalf of the International Atomic Energy Agency (IAEA). At the request of the IAEA, quantities of these materials are limited to *one unit of each RM per laboratory every 3 years*.

The isotopic compositions are given in parts per thousand difference from isotope-ratio standards--Vienna Standard Mean Ocean Water (VSMOW), Vienna PeeDee Belemnite (VPDB), atmospheric N₂ (Air), NBS28 Silica Sand (optical), and Canyon Diablo Troilite (CDT). The exception is Lithium (Li), which is expressed as an absolute isotopic ratio.

[For further information see SP260-149](#)

[For stable isotopic materials with an absolute isotopic ratio see Table 104.9](#)

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PLEASE NOTE: The tables are presented to facilitate comparisons among a family of materials to help customers select the best SRM for their needs. For specific values and uncertainties, the certificate is the only official source.

RM	Description	Nominal Unit Size	Nominal Isotopic Composition (in parts per 1000) (see Certificate of Analysis for exact values)					
			dD _{VSMOW}	⁶ Li/ ⁷ Li	d ¹³ C _{VPDB}	d ¹⁵ N _{Air}	d ¹⁸ O _{VSMOW}	d ³⁰ Si _{NBS28}
8535	VSMOW-water	20 mL	0*				0*	
8536	GISP-water	20 mL	-190				-24.8	
8537	SLAP-water	20 mL	-428*				-55.5	
8538	NBS30-biotite	2 g	-66				+5.1	
8539	NBS22-oil	1 mL	-120		-29.7			
8540	PEFI-polyethylene foil	x mg	-100		-31.8			
8541	USGS24-graphite	0.8 g			-16			
8542	Sucrose ANU-sucrose	1 g			-10.5			
8543	NBS18-carbonatite	0.4 g			-5.0		+7.2	
8544	NBS19-limestone	0.4 g			+1.95		28.6	
8545	LSVEC-lithium carbonate	0.4 g		0.0814**	-47		+3.7	
8546	NBS28-silica sand (optical)	0.4 g					+9.6	0*
8547	IAEA-N1-ammonium sulfate	0.4 g				+0.4		
8548	IAEA-N2-ammonium sulfate	0.4 g				+20.3		
8549	IAEA-N3-potassium nitrate	0.4 g				+2		
8550	USGS25-ammonium sulfate	0.4 g				-30.4		
8551	USGS26-ammonium sulfate	0.4 g				+53.5		
8552	NSVEC - gaseous nitrogen	1 tube 300 mmol				(2.8)		
8553	Soufre de Lacq - elemental sulfur	0.5 g						+16
8554	IAEA-S1-silver sulfide	0.5 g						-0.3
8555	IAEA-S2-silver sulfide	0.5 g						+21
8556	NBS123-sphalerite	0.5 g						17
8557	NBS127-barium sulfate	0.5 g					+9.3	+20
8558	USGS32-potassium nitrate	0.5 g				+179.9		
8559	NGS1-natural gas (coal origin)	<2 g	-135(CH ₄)		-29.1(CH ₄)			
8560	NGS2-natural gas (petroleum origin)	<2 g	-170(CH ₄)		-44.8(CH ₄)			
8561	NGS3 natural gas (biogenic)	<2 g	-176(CH ₄)		-73.3(CH ₄)			
8562	CO2-Heavy Paleomarine Origin	2 tubes			-3.76		+22.2	

8563 CO2-Light, Petrochemical Origin	2 tubes	-41.56	+6.6
8564 CO2-Biogenic, Modern Biomass Origin	2 tubes	-10.45	+31.0

*Exactly defined isotopic abundances

**Absolute isotopic ratio
